CLAIMS

What is claimed is:

1. A suspension assembly **(40)** in an automobile vehicle comprising:

a support frame **(42)**;

a control arm **(44)** movable relative to said support frame **(42)**;

a torsion bar **(46)** connected to said control arm **(44)** for resisting movement of said control arm **(44)** relative to said support frame **(42)**;

an adjustment lever **(50, 150, 250, 350, 450, 550, 650)** connected to said torsion bar **(46)** for placing said torsion bar **(46)** in torsion;

a torsion bar connection between said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** and said torsion bar **(46)** for connecting said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to said torsion bar **(46)** at a plurality of primary drive positions at first angular increments relative to one another; and

an indexing system **(70, 170, 270, 370, 470, 570, 670)** for positioning said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** at a plurality of intermediate drive positions at second angular increments.

2. An assembly **(40)** as set forth in claim 1 wherein said indexing system **(70, 170, 270, 370, 470, 570, 670)** includes a hub **(74, 174, 274, 374, 474, 574, 674)** independent of said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** and including said torsion bar connection to said torsion bar **(46)** at said first angular increments.

3. An assembly **(40)** as set forth in claim 2 wherein said indexing system **(70, 170, 270, 370, 470, 570, 670)** includes a hub connection between said hub **(74, 174, 274, 374, 474, 574, 674)** and said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to position said hub **(74, 174, 274, 374, 474, 574, 674)** angularly relative to said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** at said second angular increments.

4. An assembly **(40)** as set forth in claim 3 wherein said one of first angular increments defines a primary radial and offset from said primary radial by an offset angle.

5. An assembly **(40)** as set forth in claim 4 wherein said hub connection includes a pocket **(64, 164, 364, 464, 556, 656)** in said adjustment lever **(50, 150, 350, 450, 550, 650)** receiving said hub **(74, 174, 374, 474, 574, 674)** with said hub **(74, 174, 374, 474, 574, 674)** being removable from said pocket **(64, 164, 364, 464, 556, 656)** to be inverted 180 degrees about said secondary radial and reinserted into said pocket **(64, 164, 364, 464, 556, 656)** to position said primary radial relative to said secondary radial whereby said angular position of said adjustment lever **(50, 150, 350, 450, 550, 650)** may be adjusted by multiples of said offset angle.

6. An assembly **(40)** as set forth in claim 3 wherein said torsion bar connection includes a hexagonal head **(48)** on said torsion bar **(46)** and a hexagonal socket **(80, 180, 280, 380, 480, 480, 580, 680)** in said hub **(74, 174, 274, 374, 474, 574, 674)** to receive said hexagonal head **(48)** of said torsion bar **(46)** whereby said first angular increments are equal.

7. An assembly **(40)** as set forth in claim 5 wherein said second angular increments are equal and said offset angle equals one fourth of the difference between said first and second increments.

8. An assembly **(40)** as set forth in claim 7 wherein each of said first increments equals 60 degrees and each of said second increments equals 51.428 degrees, and said offset angle equals 2.14 degrees.

9. An assembly **(40)** as set forth in claim 6 wherein said hub connection includes seven teeth **(84)** and seven tooth cavities **(66)** interconnecting said hub **(74)** and said indexing system **(70)** in said pocket **(64)** thereof.

10. An assembly **(40)** as set forth in claim 3 wherein said indexing system **(170, 270, 370, 470, 570, 670)** includes at least one tooth **(184, 274, 388, 478, 578, 678)** extending radially from said hub **(174, 274, 374, 474, 574, 674)** and a tooth cavity **(166, 266, 366, 466, 566, 658)** in said adjustment lever **(150, 250, 350, 450, 550, 650)** for receiving said at least one tooth **(184, 274, 388, 478, 578, 678)**.

11. An assembly **(40)** as set forth in claim 9 wherein said at least one tooth **(84)** of said hub **(74)** presents a generally rectangular configuration.

12. A assembly **(40)** as set forth in claim 10 wherein said plurality of said teeth **(184, 274, 388, 478, 578, 678)** and said plurality of said tooth cavities **(166, 266, 366, 466, 566, 658)** are disposed on different radials than said first angular increments between said hub **(174, 274, 374, 474, 574, 674)** and said torsion bar **(46)**.

13. An assembly **(40)** as set forth in claim 10 wherein said tooth cavity **(166, 266, 366, 466, 566, 658)** extends angularly a greater degree than said tooth **(184, 276, 388, 478, 578, 678)** for allowing said hub **(174, 274, 374, 474, 574, 674)** to rotate relative to said adjustment lever **(150, 250, 350, 450, 550, 650)**.

14. An assembly **(40)** as set forth in claim 13 including an adjustment device **(268)** interacting between said adjustment lever **(250)** and said tooth **(276)** for adjusting the angular position of said hub **(274)** relative to said adjustment lever **(250)** through an infinite number of said intermediate drive positions within the angular extent of said tooth cavity **(266)**.

15. An assembly **(40)** as set forth in claim 14 wherein said adjustment device **(268)** includes a bore **(271)** in said adjustment lever **(250)** and a screw **(272)** extending through said bore **(271)** to engage said tooth **(276)** and adjust the angular position of said hub **(274)**.

16. An assembly **(40)** as set forth in claim 10 wherein said at least one tooth cavity **(658)** presents a generally triangular configuration having two sides **(660, 662)** and a

rounded bottom **(664)** interconnecting said two sides **(660, 662)**.

17. An assembly **(40)** as set forth in claim 16 wherein one **(660)** of said two sides slopes at a degree different than the other side **(662)**.

18. An assembly **(40)** as set forth in claim 1 including an adjusting mechanism **(62)** for pivoting said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to increase the amount of torsion in said torsion bar **(46)**.

19. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** for applying torsion to a torsion bar **(46)** for resisting movement of a control arm **(44)** relative to a support frame **(42)** in a vehicle; said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** comprising:

a torsion bar connection for connecting said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to the torsion bar **(46)** at a plurality of primary drive positions at first angular increments relative to one another; and

an indexing system **(70, 170, 270, 370, 470, 570, 670)** for positioning said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** at a plurality of intermediate drive positions at second angular increments.

20. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** as set forth in claim 19 wherein said indexing system **(70, 170, 270, 370, 470, 570, 670)** includes a hub **(74, 174, 274, 374, 474, 574, 674)** independent of said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** and including said torsion bar connection for connection to the torsion bar **(46)**.

21. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** as set forth in claim 20 wherein said indexing system **(70, 170, 270, 370, 470, 570, 670)** includes a hub connection between said hub **(74, 174, 274, 374, 474, 574, 674)** and said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to position said hub **(74, 174, 274, 374, 474, 574, 674)** angularly relative to said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** at said second angular increments.

22. An adjustment lever (50, **150, 250, 350, 450, 550, 650)** as set forth in claim 21 wherein said one of first angular increments defines a primary radial and one of said second angular increments defines a secondary radial, said primary and secondary radials being offset from one another by an offset angle.

23. An adjustment lever **(50,** 150, **250, 350, 450, 550, 650)** as set forth in claim 22 wherein said hub connection includes a pocket **(64, 164, 364, 464, 556, 656)** in said adjustment lever **(50, 150, 350, 450, 550, 650)** receiving said hub **(74, 174, 374, 474, 574, 674)** with said hub **(74, 174, 374, 474, 574, 674)** being removable from said pocket **(64, 164, 364, 464, 556, 656)** to be inverted 180 degrees about said secondary radial and reinserted into said pocket **(64, 164, 364, 464, 556, 656)** to position said primary radial relative to said secondary radial whereby said angular position of said adjustment lever **(50, 150, 350, 450, 550, 650)** may be adjusted by multiples of said offset angle.

24. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** as set forth in claim 23 wherein said torsion bar connection includes a hexagonal socket **(80, 180, 280, 380, 480, 480, 580, 680)** in said hub **(74, 174, 274, 374, 474, 574, 674)** to receive a hexagonal head **(48)** of a torsion bar **(46)** whereby said first angular increments are equal.

25. An adjustment lever (50) as set forth in claim 24 wherein said second angular increments are equal and said offset angle equals one fourth the difference between said first and second increments.

26. An adjustment lever **(50)** as set forth in claim 25 wherein each of said first increments equals 60 degrees and said second increments equals 51.428 degrees, and said offset angle equals 2.14 degrees.

27. An adjustment lever **(50)** as set forth in claim 24 wherein said hub connection includes seven teeth **(84)** and seven tooth cavities **(66)** interconnecting said hub **(74)** and said indexing system **(70)** in said pocket **(64)** thereof.

28. An adjustment lever **(150, 250, 350, 450, 550, 650)** as set forth in claim 21 wherein said indexing system **(170, 270, 370, 470, 570, 670)** includes at least one tooth **(184, 274, 388, 478, 578, 678)** extending radially from said hub **(174, 274, 374, 474, 574, 674)** and a tooth cavity **(166, 266, 366, 466, 566, 658)** in said adjustment lever **(150, 250, 350, 450, 550, 650)** for receiving said at least one tooth **(184, 274, 388, 478, 578, 678)**.

29. An adjustment lever **(150, 250, 350, 450, 550, 650)** as set forth in claim 28 wherein said tooth cavity **(166, 266, 366, 466, 566, 658)** extends angularly a greater degree than said tooth **(184, 276, 388, 478, 578, 678)** for allowing said hub **(174, 274, 374, 474, 574, 674)** to rotate relative to said adjustment lever **(150, 250, 350, 450, 550, 650)**.

30. An adjustment lever **(250)** as set forth in claim 29 including an adjustment device **(268)** interacting between said adjustment lever **(250)** and said tooth **(276)** for adjusting the angular position of said hub **(274)** relative to said adjustment lever **(250)** through an infinite number of said intermediate drive positions within the angular extent of said tooth cavity **(266)**.

31. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** for applying torsion to a torsion bar **(46)** for resisting movement of a control arm **(44)** relative to a support frame **(42)** in a vehicle or similar environment, and comprising:

a hub **(74, 174, 274, 374, 474, 574, 674)** having a torsion bar connection for connection to a torsion bar **(46)** at a plurality of primary drive positions at first angular increments relative to one another; and

a hub connection between said hub **(74, 174, 274, 374, 474, 574, 674)** and said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to position said hub **(74, 174, 274, 374, 474, 574, 674)** angularly relative to said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** and for allowing said hub **(74, 174, 274, 374, 474, 574, 674)** to be removed and inverted 180 degrees and reconnected to said adjustment lever **(50, 150, 250, 350, 450, 550, 650)**.

32. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** as set forth in claim 31 wherein said torsion bar connection includes a hexagonal socket **(80, 180, 280, 380, 480, 480, 580, 680)** in said hub **(74, 174, 274, 374, 474, 574, 674)** to receive a hexagonal head **(48)** of a torsion bar **(46)** whereby said first angular increments are equal..

33. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** as set forth in claim 32 wherein said hub **(74, 174, 274, 374, 474, 574, 674)** connection includes at least one tooth **(84, 184, 276, 388, 478, 578, 678)** and one tooth cavity **(166, 266, 366, 466, 566, 658)**.

34. An adjustment lever **(50, 150, 250, 350, 450, 550, 650)** as set forth in claim 33 wherein said hub connection includes seven teeth **(84)** and seven tooth cavities **(66)** interconnecting said hub **(74)** and said indexing system **(70)** in said pocket **(64)** thereof.

35. A suspension assembly **(40)** in an automobile vehicle comprising:

a support frame **(42)**;

a control arm **(44)** movable relative to said support frame **(42)**;

a torsion bar connected to said control arm **(44)** for resisting movement of said control arm **(44)** relative to said support frame **(42)**;

an adjustment lever **(50, 150, 350, 450, 550, 650)** for placing said torsion bar **(46)** in torsion and a hexagonal pocket **(64, 164, 364, 464, 556, 656)**;

a hub **(74, 174, 374, 474, 574, 674)** having a hexagonal periphery and disposed in said pocket, for connecting said adjustment lever **(50, 150, 350, 450, 550, 650)** to said torsion bar **(46)** at a plurality of primary drive positions at first angular increments

relative to one another wherein said one of first angular increments defines a primary radial and including a secondary radial, said primary and secondary radials being offset from one another by an offset angle;

an indexing system **(70, 170, 370, 470, 570, 670)** for positioning said adjustment lever **(50, 150, 350, 450, 550, 650)** at a plurality of intermediate drive positions at second angular increments;

a hub **(74, 174, 374, 474, 574, 674)** being independent of said adjustment lever **(50, 150, 350, 450, 550, 650)** and including said torsion bar connection to said torsion bar **(46)** at said first angular increments, wherein said hub **(74, 174, 374, 474, 574, 674)** presenting a hub connection defined between said hub **(74, 174, 374, 474, 574, 674)** and said adjustment lever **(50, 150, 350, 450, 550, 650)** to position said hub **(74, 174, 374, 474, 574, 674)** angularly relative to said adjustment lever **(50, 150, 350, 450, 550, 650)** at said second angular increments with said hub connection including a pocket **(64, 164, 364, 464, 556, 656)** in said adjustment lever **(50, 150, 350, 450, 550, 650)** for receiving said hub **(74, 174, 374, 474, 574, 674)** with said hub **(74, 174, 374, 474, 574, 674)** being removable from said pocket **(64, 164, 364, 464, 556, 656)** being inverted 180 degrees about said secondary radial and reinserted into said pocket **(64, 164, 364, 464, 556, 656)** to position said primary radial on the opposite angular side of said secondary radial whereby said angular position of said adjustment lever **(50, 150, 350, 450, 550, 650)** may be adjusted by multiples of said offset angle;

at least one tooth **(84, 184, 388, 478, 578, 678)** extending radially from said hub **(74, 174, 374, 474, 574, 674)** with said at least one tooth **(84, 184, 388, 478, 578, 678)** having a configuration complementary to said at least one tooth cavity **(66, 166, 366, 466,**

566, 658) defined in said adjustable lever **(50, 150, 350, 450, 550, 650)**; and

an adjusting mechanism **(62)** for adjusting the rotational position of said adjustment lever **(50, 150, 250, 350, 450, 550, 650)** to adjust the amount of torsion in said torsion bar **(46)**.